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The Impact of Innovation Capability of Firms on Competitive Advantage: An Empirical Study of the ICT Industry in Thailand

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Abstract

The goal of the study was to see how quality management (QMA), strategy (STR), and innovative capability (INC) influence the competitive advantage of a Thai information communication technology (ICT) firm (COA). The researchers collected 431 surveys from Thailand's owners and managers employed in ICT enterprises from the beginning of June 2021 to the end of September 2021using diverse sample strategies. A questionnaire with an index of item-objective congruence (IOC) value of 0.60−1.00 and a reliability value of 0.92–0.96 was used as the research tool. Participants in the survey were requested to fill out a seven-level opinion survey posted on Google Forms. A latent variable structural equation model (SEM) path analysis using LISREL 9.1 was used for the four latent variables, 31 manifest variables, and the five hypotheses testing. The analysis showed that all three causal variables positively affected COA, which had a total effect (TE) R^2 value = 80% when combined with the other latent variables. Moreover, the values for the latent variables when ranked by total effect (TE) were STR, QMA, and INC with TE values of 0.95, 0.89, and 0.25, respectively. Finally, there were very strong influences from COA to STR (0.95), INC to QMA (0.86), and STR to QMA (0.71).

Keywords: Innovative Capability, Quality Management, ICT, Strategy, Thailand

JEL Classification Code: L63, L86, L96, M13, M15

1. Introduction

Thailand is currently working to establish digital communities, innovative digital start-up networks, and digital parks. These activities are being carried out under the 'Thailand 4.0' umbrella of sustainable innovation and value-added steps. Thailand 4.0 and ICT are becoming major drivers in national development and the transition to a knowledge-based, digital economy as a hybrid enabler modeled in some ways after 'Industry 4.0' and the 'Internet of Things' (IoT) (Digital Economy, 2015; Wongwuttiwat & Lawanna, 2018).

The Statista Research Department (2021) has also given some extremely important figures on Thailand's existing and anticipated ICT market value. Thailand's software business was valued at $3.96 billion in 2020, according to the group's estimates, and is expected to expand to $5.05 billion in 2022. In addition, they estimated that the digital market will be worth $19.24 billion in 2020. Furthermore, although Thai ICT spending was expected to fall due to business closures and tourism sector disruption as a result of the COVID-19 pandemic, later projections imply that it may have increased as much as 5% in 2021 due to remote work/office infrastructure spending.

Other recent data suggests that Thailand's ICT/Internet/Digital economy would top $30 billion in 2021, up 51% from the previous year (Leesa-nguansuk, 2021). By 2025, Thai e-commerce will be worth $35 billion, transportation and food will be worth $5.2 billion, online travel will be worth $8.5 billion, and online media will be worth $7.9 billion. By 2025, Thailand's 'Internet economy' will be worth around $53.6 billion (e-Conomy SEA, 2021). As a result, information and communication technology

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(ICT) is a critical enabler of a country's development and transition to a knowledge-based, digital economy (Sermsri et al., 2021). Unfortunately, Thailand has a scarcity of skilled ICT professionals, according to the International Labour Organization (ILO) (2019), with ICT specialists accounting for only 1% (386,000) of the country's total workforce. Furthermore, Thailand only graduated 34,283 people in ICT, science, and maths together in 2017. This was the equivalent of 10% of Thai graduates in that year's class. Thailand, like Indonesia and India, had 33 percent of its ICT experts' roles filled by women, according to the ILO ICT workforce survey.

Furthermore, ICT companies are reliant on innovation at their heart. According to Adler and Shenhar (1990), innovation is defined as a company's ability to upgrade and produce new items that meet market needs while also obtaining new technology that opens up new opportunities. Firm innovation and its use with ICT are also predictors of a firm's performance and a key factor in outperforming competitors (Gërguri-Rashiti et al., 2017).

Production and exports, better sales growth, higher market share, and the efficiency with which the organization creates cash flow and profit are all contributing variables (Aujirapongpan & Jutidharabongse, 2020; Lyver & Lu, 2018; Oliveira et al., 2018). Furthermore, other academics have stated that inventing new products, components, or services that are distinct from the competitors is an important factor in attracting clients (Lyver & Lu, 2018; Nguyen et al., 2018; Rajapathirana & Hui, 2018). The value of IT spending is increasing every year to keep up with the pace and expansion of Thailand's Internet and e-commerce industry.

However, as shown in Figure 1, the growth is segmented across multiple economic sectors. This, in turn, creates software and hardware procurement problems for both in-house ICT staff and external system integration contractors from which efficiency, price, and technology choices will arise. Therefore, the efficiency and rapidity of a firm's *innovative capability* (IC) can be mirrored by its ability to embrace and implement these fast-paced changes. Additionally, Ferreira et al. (2019) added that IC is a crucial resource that drives an organization's success or failure within its marketplace.

As can be seen, strategy (ST) is considered as an important component in the debate of IP, with Nguyen et al. (2018) emphasizing the need of setting long-term quality goals. Furthermore, innovation is the product of a company's internal R&D or its capacity to mimic innovative ideas from other businesses (Lewin & Massini, 2003). As a result, firms must select whether their learning activities are based on the internal or external environment using strategic emphasis (Beyene et al., 2016).

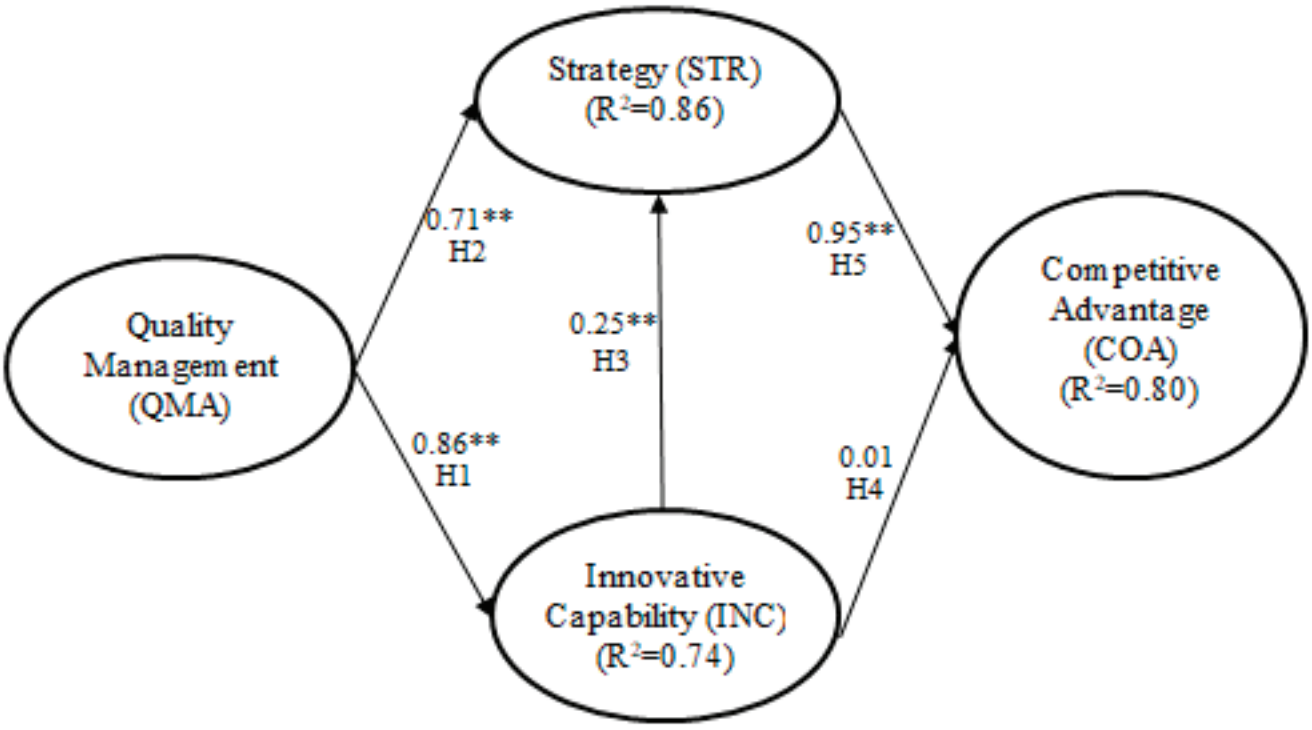

Figure 1: Final SEM for Thai ICT CA

Note: **indicates significant at 5% level of significance based on *t*-statistics

The quality of a company's output is closely linked to ST. Quality management (QM) has become not only a requirement but also a managerial solution to create a competitive advantage (CA) in an ever-growing competitive economic environment (Bouzguenda & Maazoun, 2020). As a result, companies must regard quality as a critical component of their strategic plans. As a result, the authors offer four key antecedents in a competitive ICT advantage (COA). Quality management (QMA), strategy (STR), and inventive capability (INC) are a few of them, and they're all covered in the literature study.

2. Literature Review

2.1. Innovative Capability (INC)

The ability of an organization to produce new or improved products, services, or processes by finding new ideas is a widely accepted definition of INC (Aas & Breunig, 2017). Lee and Xuan (2019) in China have highlighted the importance of the Chinese government and private sector in regularly monitoring industry and universities' new high-efficiency innovation methods in creating technical change and product innovation. Furthermore, considerable parallels can be found in the literature between the ideas of 'dynamic capability (DC),' which started with Teece et al. (1997). In a continually changing world, DC, like INC, helps companies to build, reconfigure, and integrate their internal and external competencies. DCs are also important in analyzing differential business performance, according to Wang et al. (2015).

Furthermore, a review of the literature reveals that INC is a very new and difficult subject of study. In addition, there appears to be some dispute over how INC promotes innovation and how it is generated and used (Helfat & Peteraf, 2003; Lidija & Robert, 2014). However, a common thread running through the INC literature is that value is determined not by resource possession but by how well those resources are used. As a result, the demand for continued expertise and innovation, as well as the accompanying development of entrepreneurial management abilities, is constant (Aas & Breunig, 2017). As a result, seven manifest variables have been identified as having the potential to influence inventive capability (INC). These were x1 through x7, as listed in Table 2.

2.2. Quality Management (QMA)

Quality management (QMA) has been linked to knowledge management (KM) in numerous studies, with QMA serving as a support for KM (Bouzguenda & Maazoun, 2020). This is in line with Colurcio (2009)'s claim that TQM (Total Quality Management) makes knowledge development and dissemination easier. TQM procedures

Table 1: Respondents' Characteristics

Characteristic	Number	%
Gender		
Male	176	40.84
Female	255	59.16
Total	431	100
Age		
under 30 years old	62	14.39
31–40 years of age	136	31.55
41–50 years of age	133	30.86
51–60 years of age	77	17.87
over 60 years of age	23	5.34
Total	431	100
Education Levels		
Vocational Certificate/High Vocational Certificate/Diploma	119	27.61
Bachelor's degree	191	44.32
Postgraduate	12	2.78
Other such as secondary school	109	25.29
Total	431	100
Position		
Business owner	375	87.01
Manager/Executive	56	12.99
Total	431	100
Company Status		
Company	348	80.74
Partnership	83	19.26
Total	431	100
Company Age		
less than one year	25	5.80
1–5 years	99	22.97
6–10 years	118	27.38
more than ten years	189	43.85
Total	431	100
Employees		
no more than ten people	197	45.71
11–20 people	119	27.61
21–30 people	108	25.06
More than 30 people	7	1.62
Total	431	100

(Jayawarna & Holt, 2009), help to promote knowledge creation, and TQM adoption is a motivator for strengthening customer relationships. As a result, six manifest variables have been identified as having the ability to influence quality management (QMA). The numbers were x8 to x13, as shown in Table 2.

2.3. Strategy (STR)

Innovation, knowledge, and capabilities are crucial to company performance and strategy research, according to Knight and Cavusgil (2004). Furthermore, the authors claim that innovative companies build their distinctive knowledge and talents, which boost organizational effectiveness. In an interview with Norwegian wood industry CEOs, Nybakk and Jenssen (2012) discovered that creative STR was critical to profitability. Arvanitis et al. (2012) examined the impact of five ICT-related 'soft' dimensions on a company's IP in Greece and found that ICT employees, skills, strategy, and procedures were critical to IP. As a result, six manifest variables were identified as having the ability to influence strategy (STR). These were y1 through y6, as shown in Table 2.

Table 2: Results from the Study's CFA, Reliability, and Validity Testing

LV	*α*	AVE	CR	Manifest variables (31 items)	Loading	R^2
INC	0.96	0.75	0.95	I believe my company must create an innovative corporate culture (x1).	0.82	0.68
				My company must use knowledge from multiple sources to quickly and efficiently develop our organization (x2).	0.87	0.75
				I believe it is necessary that my company quickly adapts to technological change (x3).	0.83	0.69
				My company must adapt to changing market conditions, customer needs, and competing products (x4).	0.91	0.84
				I believe my company must encourage our staff to participate in product development, innovative process improvement, and new idea generation (x5).	0.87	0.76
				My company must recruit new staff with high innovative capabilities (x6).	0.85	0.72
				My company must cooperate with other innovative, capable organizations or universities (x7).	0.89	0.79
QMA	0.94	0.71	0.92	I believe my company's management must be involved in quality improvement (x8).	0.82	0.67
				My company employees must be involved in quality improvement (x9).	0.76	0.58
				My company must implement processes for continuous review of new product designs (x10).	0.87	0.75
				My company must view customer needs and product quality as necessary (x11).	0.86	0.74
				My company must meet customer expectations with product quality performance (x12).	0.89	0.79
				My company must focus on quality management systems for innovative products and services (x13).	0.87	0.76
STR	0.94	0.70	0.93	I believe my company must have a strategy that allows innovative products that reflect the customer's needs (y1).	0.80	0.65
				My company must develop a business plan based on information about our customer's needs (y2).	0.83	0.68
				My company must focus on advanced technology development that solves problems (y3).	0.86	0.75
				I believe my company must adopt proactive innovation policies to achieve new technological leadership in the marketplace (y4).	0.88	0.77
				I believe my company must adopt a creative management strategy that is unique in the marketplace (y5).	0.79	0.63
				I believe it is necessary that my company forecast future technology trends and customer needs to formulate a long-term strategy (y6).	0.85	0.72

LV	α	AVE	CR	Manifest variables (31 items)	Loading	R^2
COA	0.92	0.72	0.94	My company must create unique products in the marketplace (y7).	0.89	0.80
				My company must obtain manufacturing knowledge to try new ways of doing things regularly (y8).	0.81	0.65
				My company must constantly seek ways to enhance its competitive advantage (y9).	0.86	0.73
				I believe my company must use effective cost control (y10).	0.85	0.72
				I believe it is necessary that my company quickly delivers quality, innovative products and reliable technology (y11).	0.89	0.79
				I believe it is necessary that my company wins product innovation awards and be recognized in the technology industry (y12).	0.77	0.60

2.4. Competitive Advantage (COA)

According to Seeman and O'Hara (2006), COA is based on the delivery of high-quality service. Customer relationship management (CRM) is a business approach that involves customer education, loyalty, and satisfaction, according to the authors. This is in line with Tangtatswas et al. (2019), who claim that if entrepreneurs do not leverage ICT and technology to their advantage, their competition will take their COA. Also, while brand loyalty is important, entrepreneurs must keep up with technology and innovate to avoid being displaced by their competitors. This is in line with the findings of Gursoy et al. (2014) and Sun et al. (2013), who both believe that customer loyalty is important for COA and a company's performance in the marketplace. The ability of an organization to use efficient knowledge management is also closely linked to good QMA processes. This is in line with the findings of Kocoglu et al. (2012), who discovered that COA sustainability depends on the ability to adapt to and absorb new technologies. As a result, six manifest variables have been identified as having the ability to influence competitive advantage (COA). The ages ranged from y7 to y12, as shown in Table 2.

2.5. Research Objectives

1. From the development and analysis of the SEM model, to investigate the construct and manifest variable interrelationships influencing COA.
2. To assess the proposed model's fit by using a GOF and CFA before the SEM.

2.6. Hypotheses Statements and Conceptual Model

The authors propose the following five hypotheses and conceptual model shown in Figure 1:

H1: *QMA directly affects INC.*
H2: *QMA directly affects STR.*
H3: *INC directly affects STR.*
H4: *INC directly affects COA.*
H5: *STR directly affects COA.*

3. Research Methods and Materials

3.1. Population and Sample

Companies that were members of the Thai Electrical and Electronics Institute made up the study's population (EEI). There were 2,481 respondents at the time of the survey in 2021. Using Hair et al. (2016) and Schumacker et al. (2016)'s accepted sampling theory, it is advised that one technique for determining sample size is to gather 10–20 questionnaires for each of the study's observable variables. Table 2 shows the 31 observed variables for the five latent variables in the study. For the sample collection, the researchers utilized a window with a lower end of 10 × 31 (310) and a higher end of 20 × 31 (620). After determining the sample size, the researchers employed systematic random sampling to contact the businesses through email, followed by a phone call to confirm the study's participation invitation email.

3.2. Survey Questionnaire Design

The questionnaire was divided into two sections, the first of which included seven questions regarding each person's personal, professional, and firm traits (Table 1). The five hidden variables and 31 observable variables were covered in Section 2. (Table 2). The questionnaire also used a seven-level scale, with '7' representing 'strongly agree' (5.26–6.10), '6' representing 'somewhat agree' (4.41–5.25), '4' representing 'moderate agreement' (3.56–4.40), '3' representing 'somewhat disagree' (2.71–3.55), '2' representing 'disagree' (1.86–2.70), and finally '1' representing 'agree the least' (1.00–1.85) (Ruenphongphun et al., 2021).

3.3. Research Instrument Quality Assessment

A content validity (CV) examination was conducted after the questionnaire was designed, involving five experts in respective disciplines (Chuenban et al., 2021). It has been suggested that strength and validity from the research design and subsequent questionnaire come from how accurately the variables are selected and measured. To determine CV, the authors employed Cronbach's measurement scale values as an analysis tool. From Taber's (2018) analysis of α values, experts felt that overall, the items' reliability was strong (0.91–0.93) to excellent (0.93–0.94).

3.4. Survey Instrument Pre-Test and Measurement of Validity

A pilot test was undertaken before the actual surveys in which 30 individuals participated who were not part of the final survey. The purpose of this process was to determine each item's questionnaire relevance and the item's clarity (Pimdee, 2020).

3.5. Data Collection

The researchers collected information from executives and managers of ICT component manufacturers in Thailand via an online questionnaire (Google Form). Prior to this, each company was chosen through systematic random sampling from two rounds of component manufacturer solicitations, phone calls, and emails. During June and July 2021, follow-up coordination was done by phone and delivering a link to an online Google Form questionnaire. The sampling technique yielded a response rate of 32%. The researchers subsequently conducted Round 2 using simple random sampling, which began in August 2021 and ended on September 30, 2021, the collecting deadline. At this point, the researchers had determined that 431 questionnaires were acceptable for use in the study.

3.6. Data Analysis

Analysis of the data was undertaken to determine the validity of the results from the SEM model on the importance of the variables to a Thai ICT CA.

4. Results

4.1. Characteristics of the Respondents

Table 1 shows the replies of the 431 ICT SME business owners and managers who took part in the survey. We may deduce from it that the majority of the entrepreneurial respondents (59.16 percent) were women, with the majority of them being between the ages of 31 and 50. (62.41 percent). Furthermore, less than half of the entrepreneurs and managers had earned a bachelor's degree (44.32 percent). Surprisingly, the age of these small ICT businesses was greater than predicted, with 43.85% of them being over ten years old. Finally, 98.38% had 30 or fewer employees.

4.2. Goodness-Of-Fit (GOF) Appraisal

The GOF for the measurement model was first established during the study's CFA, as Jöreskog et al. (2016) suggested that a CFA should be undertaken to assess the model's construct validity (CV). The theory then suggests that CV uses discriminant and convergent validity as measurement tools (Westen & Rosenthol, 2003). Also, when the LISREL 9.1 software is used, $\chi 2$ and $\chi 2/df$ (relative Chi-square) values are created, which should have values of $p \geq 0.05$ and ≤ 2.00, respectively (Byrne et al., 1989; Rasch, 1980). LISREL also outputs values for other indices. These include the goodness of fit index (GFI), comparative fit index (CFI), and the root mean square error of approximation (RMSEA). Their suggested minimum acceptability values are ≥ 0.90, ≥ 0.95, and ≤ 0.05, respectively.

Also, Schumacker and Lomax (2016) suggests that values for the normed fit index (NFI), the adjusted goodness-of-fit index (AGFI), root mean square residual (RMR), and standardized root mean square residual (SRMR) should be ≥ 0.90, ≥ 0.90, ≤ 0.05, and ≤ 0.05, respectively (Hooper et al., 2008; Hu & Bentler, 1999; Schumacker & Lomax, 2016). Therefore, all the GOF values significantly exceeded the suggested minimal GOF criterion, implying that the model fit was excellent (Cangur & Ercan, 2015) as $\chi^2 = 0.70$, $\chi^2/df = 0.95$, RMSEA = 0.00, GFI = 0.96, AGFI = 0.93, RMR = 0.02, SRMR = 0.02, NFI = 0.99, and finally, the CFI = 1.00.

4.3. The Corroborative Component Analysis

The results of the CFA, as well as related validity and reliability testing, are summarised in Table 2. The Cronbach's analysis results are shown in the first column, with strong values for the questionnaire latent variables ranging from 0.92 to 0.96 (George & Mallery, 2010; Tavakol & Dennick, 2011). Second, we discovered that the extracted average variance (AVE) values ranged from 0.67 to 0.75. According to Hair et al. (2016), the average variance extracted (AVE), correlations (major loadings), and construct/composite reliability (CR) are the best methods for achieving construct validity (CV), with AVE values of 0.5 and CR values of 0.6 being satisfactory (Fornell & Larcker, 1981). The analysis showed additional reliability as the CR values were 0.92–0.95, and the loadings/correlation values were strong as they were between 0.73–0.91.

Table 3: The Correlation Coefficient Between Latent Variables (Under the Diagonal)

Latent Variable	QMA	INC	STR	COA
Quality Management	1.00			
Innovative Capability	0.87	1.00		
Strategy	0.86	0.81	1.00	
Competitive Advantage	0.83	0.78	0.90	1.00
Mean	5.67	5.74	5.71	5.76
Standard deviation	0.98	1.01	0.95	0.93
Skewness	–0.90	–1.00	–1.09	–0.99
Kurtosis	0.48	0.57	1.57	1.23

Table 4: Mediation Effect Results

Dependent Variables	R^2	Effect	Independent Variables		
			QMA	INC	STR
Competitive Advantage (COA)	0.80	DE		0.01	0.95**
		IE	0.89**	0.24**	–
		TE	0.89**	0.25**	0.95**
Strategy (STR)	0.86	DE	0.71**	0.25**	
		IE	0.21**	–	
		TE	0.92**	0.25**	
Innovative Capability (INC)	0.74	DE	0.86**		
		IE	–		
		TE	0.86**		

Note: **Sig. ≤ 0.01, DE = Direct Effect, IE = Indirect Effect, TE = Total Effect.

4.4. Latent Variables Correlation Coefficients

In Table 3, the correlation coefficient testing results are shown. A common interpretation value used for these results is that 0.50 – 1 represents a strong correlation (Chuenban et al., 2021). Also, it has been suggested that when standardized factor loading values ≥ 0.60, discriminant validity is further confirmed (Henseler et al., 2015).

4.5. Mediation Effects on the Dependent Latent Variables and Independent Latent Variables

The Table 4 analysis showed that all the model's causal variables positively affected Thai ICT CA, which, when combined, had an R^2 value = 80%. Moreover, the values for the latent variables when ranked by total effect (TE) were STR, QMA, and INC with TE values of 0.95, 0.89, and 0.25, respectively. Finally, there were very strong influences from COA to STR (0.95), INC to QMA (0.86), and STR to QMA (0.71).

Table 5: Research Hypotheses Testing Results

Hypothesis Statements	Coefficient	*t*-test	SEM Testing Results
H1: QMA directly affects INC	0.86	17.50**	Consistent
H2: QMA directly affects STR	0.71	11.94**	Consistent
H3: INC directly affects STR	0.25	5.16**	Consistent
H4: INC directly affects COA	0.01	0.28	Inconsistent
H5: STR directly affects COA	0.95	15.90**	Consistent

Note: **indicates significant at 5% level of significance based on *t*-statistics.

4.6. Hypotheses Testing

Table 5 and Figure 1 show the LSREL 9.1 SEM analysis results, from which four of the five hypotheses were supported.

5. Discussion

The analysis showed that all three causal variables positively affected COA, which, when combined, had a total effect (TE) R^2 value of 80%. Moreover, the values for the latent variables when ranked by total effect (TE) values were STR, QMA, and INC with 0.95, 0.89, and 0.25, respectively. Moreover, there were very strong influences from COA to STR (0.95), STR to QMA (0.71), and INC to QM (0.86).

5.1. QMA Hypotheses and Descriptive Statistics Testing

The first two hypotheses had strong, supported connections, with H1's QMA to INC having r = 0.86, t-test = 17.50, and a p 0.01, and H2's QMA to STR having r = 0.71, t-test = 11.94, and a p 0.01. Also, according to the descriptive statistics analysis of the study, the capacity to have a mechanism for continuous review of new product designs was most critical (x10) (mean = 5.74, SD = 1.16), according to the ICT firm owners and managers. The ability to manage product quality performance that meets customer expectations (x12) (mean = 5.71, SD = 1.12) came in second. These findings are in line with those of Jambul

and Dzhulayeva (2015), who found that quality is the primary strategic goal in organizations with top management executives in Japan, the United States, and Europe.

5.2. INC Hypotheses and Descriptive Statistics Testing

Results for the two hypotheses testing for INC's latent variable relationships showed that H1 was weak but supported (r = 0.25, t-test = 5.16, and a $p \leq 0.01$) while H2 was unsupported (r = 0.01 and t-test = 0.28). However, from the study's descriptive statistics analysis, the ICT company owners and managers believed that their firm's ability to adapt to technological change (x3) quickly was most important (mean = 5.81, SD = 1.17). This finding is in line with Akman and Yilmaz (2008), who found that in the Turkish software business, organizations need to focus on client orientation.

Second, the importance of the respondents' company adjusting to changing market conditions, consumer wants, and rival products (x4) (mean = 5.78, SD = 1.13) was ranked second. This agrees with Helfat et al. (2007), who suggested that INC should concentrate on transforming its customers. Rajapathirana and Hui (2018) also discovered a strong empirically supported link between INC, innovation activities, and business performance.

5.3. STR Hypotheses and Descriptive Statistics Testing

In H5, the final hypothesis testing demonstrated a strong link between STR and COA (r = 0.95, t-test = 15.90, and p 0.01). In addition, according to the descriptive statistics analysis (Table 8), the ICT firm owners and managers consider that their company needs to implement a creative management approach that is unique in the marketplace (y5) as the most crucial (mean = 5.78, SD = 1.09). The ability to foresee future technology developments and client needs to formulate a long-term plan (y6) (mean = 5.74, SD = 1.10) came in second. These findings are in line with those of Aujirapongpan and Jutidharabongse (2020), who found that businesses should improve their product purchasing process to better suit the needs of their clients, hence improving CA, sales, and profits.

COA was crucial for each firm's development and survival within their various marketplaces within Malaysia's engineering industry, according to Ling and Mansori (2018). Also, according to the descriptive statistics analysis of the study, the ICT firm owners and managers considered their company's ability to generate distinctive items in the marketplace to be most important (y7) (mean = 5.80, SD = 1.10). Their firm's ability to gather manufacturing expertise that allows them to test new ways of doing things regularly (y8) (mean = 5.77, SD = 1.10) came in second. These findings are in line with those of Ling and Mansori (2018), who stated that COAs are created when a company discovers a new or more efficient technique to develop than its competitors. Finally, Firman and Thabrani (2018) demonstrated how dynamic skills and innovation influence COA positively and significantly.

As we've seen, Thailand is making significant progress toward becoming a digitally based society of knowledge workers. For more than five years, efforts have been made to offer high-speed broadband to every Thai village, with 74,987 villages having been reached by 2021. As Rajapathirana and Hui (2018) have concluded, innovation's utilization of available technology and resources necessitates a different type of knowledge and information system, the most important of which is knowledge management. In Sri Lanka, however, as Samsudeen et al. (2021) have pointed out, technology adoption plays a role in industrial structure, leading to changes in competition rules, the establishment of COA, and a method to use technology to surpass competitors.

6. Conclusion and Limitations

The authors set out to investigate how quality management (QMA), strategy (STR), and innovative capability (INC) influenced a Thai information communication technology (ICT) company's competitive advantage (COA). The SEM analysis showed that all three causal variables positively affected COA, which, when combined, had a total effect (TE) R^2 value of 80%. Moreover, the values for the latent variables when ranked by total effect (TE) were STR, QMA, and INC with TE values of 0.95, 0.89, and 0.25, respectively. Also, there were very strong influences from COA to STR (0.95), STR to QMA (0.71), and INC to QM (0.86).

Although the study took place in the summer of 2021 under severe lockdown conditions precipitated by the multi-year COVID-19 pandemic, the authors managed to survey 431 Thai ICT entrepreneurs and managers using online questionnaire responses using Google Form. However, we believe follow-up studies under less constraining conditions can reveal greater detail from a more comprehensive sampling group. A qualitative approach is another way in which one-on-one interviews are conducted, or the use of focus groups for triangulation of findings to explore more insights and justify the current results is also possible. Finally, because this study has a limitation that may impact the results, we cannot dismiss the non-significant effects of other latent factors.

Thailand's ICT/digital e-commerce sector is reaching new heights, according to the report. The study also found that Thailand's ICT skills are at an all-time low as a

percentage of the overall domestic employment. However, to improve their performance, sustainability, and competitive advantage, the ICT enterprises that support this dynamic and complicated environment require guidelines. As a result, this research provides some specific pointers to help them better navigate this risky and fast-paced environment. Finally, the survey adds to the body of knowledge about how Thai ICT entrepreneurs assess their company's competitive advantage in the marketplace.

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